

Amendments to the Specification

On page 1, line 3, after the Title of the Invention, please insert the following bolded caption and paragraph:

Cross Reference to Related Applications

This application is based on International Application No. PCT/NO03/00416, filed 12 December 2003, having an International Publication Number of WO 2004/055323 A1 and an International Publication Date of 1 July 2004, which is based on Norwegian Patent Application No. 2002 6021, filed 13 December, 2002.

On page 2, lines 9-19, please replace the paragraph set forth therein with the following:

Separation of air into an "oxygen-depleted stream" and an "oxygen-enriched stream" is described in ~~US~~ U.S. Patent Nos. 5,388,645 and ~~US~~ 6,119,778. The oxygen-depleted stream is used for injection into a "solid carbonaceous formation" for improved recovery of ~~methane~~ methane, and at least a part of the oxygen-enriched stream is used for reaction with a reactant stream containing at least one oxidizable reactant. Examples of processes are ~~steel-making~~ steelmaking operations, production of non-ferrous metals, chemical oxidation processes and production of synthesis gas for Fischer-Tropsch synthesis of higher hydrocarbons from natural gas. The oxygen-depleted stream has a ~~nitrogen-to-oxygen~~ nitrogen-to-oxygen volume ratio of 9:1 to 99:1. A ~~too-high ratio~~ too-high ratio may lead to the formation of an explosive gas. An oxygen-depleted gas, e.g. nitrogen, for injection into an oil field to enhance the production preferably includes less than 0.1 % oxygen.

On page 2, lines 21-22, please replace the paragraph set forth therein with the following:

No other integration between the processes using the oxygen-depleted and oxygen-enriched streams is mentioned in ~~US~~ U.S. Patent Nos. 5,388,645 or ~~US~~ 6,119,778.

On page 2, lines 24-31, please replace the paragraph set forth therein with the following:

~~US~~ U.S. Patent No. 4,344,486 relates to a method for enhanced oil recovery where a mixture of carbon dioxide and contaminants comprising hydrocarbon, hydrogen sulfide or mixtures thereof is recovered from an underground formation; the recovered mixture is combusted with an ~~oxygen-enriched~~ oxygen-enriched stream to form a concentrated carbon dioxide stream where at least a part of ~~said~~ the carbon dioxide stream is injected into ~~a~~ an underground formation to enhance recovery of liquid hydrocarbon. It is also described to use nitrogen from an air separation unit for ~~injection~~ injection, together with the concentrated carbon dioxide stream.

On page 3, lines 13-17, please replace the paragraph set forth therein with the following:

A process for preparation of higher hydrocarbons and for enhancing the production of crude oil from an underground formation is described in ~~CA~~ Canadian Patent No. 1,250,863. The off-gas from the synthesis plant is oxidized into mainly CO₂ and H₂O before it is injected into the underground formation. ~~Preferable~~ Preferably, the presence

of nitrogen is avoided by using oxygen from an air separation unit for all oxygen-demanding processes.

On page 3, line 20 to page 4, line 2, please replace the paragraph set forth therein with the following:

According to the present invention, there is provided a method for increasing oil recovery from an oil reservoir in which method gas is injected into the reservoir, comprising the steps of:

- ~~separation of~~ separating air into an oxygen-rich fraction and a nitrogen-rich fraction[[,]];
- providing a natural gas stream and leading the natural gas stream and at least a part of the oxygen-rich fraction to a reformer for conversion to synthesis gas mainly comprising H₂, CO and CO₂ and lower amounts of non-converted methane, water vapor and nitrogen[[,]];
- ~~formation of~~ forming methanol or other oxygenated hydrocarbons or higher hydrocarbons from the synthesis gas in a synthesis unit[[,]];
- withdrawing raw synthesis products and a waste gas from the synthesis unit[[,]]; and
- injecting the nitrogen-rich fraction and at least a part of the waste gas into the oil reservoir to increase the oil recovery from the reservoir[[,]].

On page 4, line 4-6, please replace the paragraph set forth therein with the following:

~~Preferably~~ Preferably, all or some of the waste gas from the synthesis unit is sent to a ~~CO₂~~ CO₂ recovery unit including a CO shift ~~converter~~ converter, where ~~CO₂~~ CO₂ is removed and injected into the reservoir and the remaining hydrogen-rich stream is used for other purposes.

On page 4, lines 11-26, please replace the paragraph set forth therein with the following:

Also provided is a plant for providing gas for ~~downhole~~ down-hole injection for pressure support in an oil reservoir for ~~recovering~~ recovery of hydrocarbons and production of oxygenated hydrocarbons or higher hydrocarbons from natural gas, comprising:

- an air separation unit for production of an oxygen-rich fraction for supply to processes that require oxygen, and a nitrogen-rich fraction for injection;
- a reformer for conversion of a mixture of natural gas, water and oxygen or ~~oxygen-enriched~~ oxygen-enriched air from the air separation unit into a synthesis gas comprising mainly H₂, CO, CO₂ and small amounts of methane in addition to any inert gas, such as nitrogen;
- a synthesis unit for conversion of the synthesis gas for synthesis of oxygenated hydrocarbons, or for synthesis of higher hydrocarbons;
- means for injecting gas into the reservoir;
- means for transferring nitrogen from the air separation unit to the means for injecting gas; and

- means for transferring at least a part of a waste gas from the synthesis unit to the means for injecting gas.

On page 6, lines 2-7, please replace the paragraph set forth therein with the following:

Figure 1 shows a schematic diagram of an embodiment of the present invention;

Figure 2 shows a schematic diagram of alternative options for the present invention;

Figure 3 shows an alternative embodiment of the present invention;

Figure 4[[;]] shows an alternative embodiment of the present invention; and

Figure 5 is an illustration of the economical impact of the integrated process according to the present invention.

On page 8, lines 24-28, please replace the paragraph set forth therein with the following:

The desired composition of the synthesis gas will depend on the process for which it is to form the raw material. The optimum stoichiometric number for methanol synthesis [[s]] is around 2.05, while the desired stoichiometric number for production of synthetic fuel often lies in the range 1.6 to 1.9, as a higher stoichiometric number gives a greater yield of lighter hydrocarbons than desirable.

On page 11, lines 13-20, please replace the paragraph set forth therein with the following:

When the synthesis unit 15 is a synthesis unit for production of synthetic fuel, synfuel, it may also be desirable to recycle non-reacted synthesis gas from line 17 to the reformer

8 via line 26. By recycling via line 26, the H₂/CO ratio of the synthesis gas may be adjusted to the desired value, i.e. around 2.0 or just below 2.0, and the CO yield and thereby also synthetic fuel yield may be increased by the high content of CO₂ in the recycling gas gas, suppressing further conversion of CO to CO₂ through the shift reaction in the autothermal reformer. Here, it should be noted that CO₂ is to be considered an inert gas in the F-T synthesis.

On page 11, lines 22-26, please replace the paragraph set forth therein with the following:

If the reformer 8 produces more synthesis gas than can be converted in the synthesis unit 15, some of the synthesis gas may be led from a line 14 running between the CO₂ recovery unit 13 and the synthesis unit 15, and around the synthesis unit 15 in a bypass line 25. This may also be desirable if there is a wish to produce more heat or power in a furnace or gas turbine 23.

On page 14, lines 4-8, please replace the paragraph set forth therein with the following:

The ~~cooled-down~~ cooled-down syngas leaves the cool-down unit 52 through a line 42 and is passed through a membrane unit ~~43~~ 43, where hydrogen is separated from the syngas to give a an H₂/CO ratio that is useful for the further reactions. A ~~not-shown~~ not-shown water separation unit may be placed between the cool-down unit 52 and the membrane unit 43 to separate water ~~from~~ from the syngas before it is introduced into the membrane unit 43.

On page 14, lines 10-16, please replace the paragraph set forth therein with the following:

The decant water separated from the syngas is led through line 49 to the EOR 6, and hydrogen is withdrawn through line 48 and can be used as fuel gas or for feed gas ~~desulfurisation~~ desulfurization or hydrotreating/hydrocracking of oils fractions. The syngas leaving the membrane unit 43 through a line 44 is introduced into a Fischer-Tropsch (FT) synthesis loop 56 for production for higher hydrocarbons. Higher hydrocarbons in the present description are hydrocarbon molecules having three or more carbon atoms, more preferably five or more carbon atoms.

On page 14, lines 21-22, please replace the paragraph set forth therein with the following:

Raw higher hydrocarbon product from the FT synthesis loop 56 is ~~withdraw~~ withdrawn through a line ~~57~~ 57, and the produced water is withdrawn through a line 58 and passed to the EOR 6.

On page 15, lines 1-6, please replace the paragraph set forth therein with the following:

The remaining tail gas, or the ~~hydrogen-poor~~ hydrogen-poor fraction, in line 65 may be split into two streams, one in a line 59 that is introduced to the EOR and another stream in a line 45 that is used as fuel for a power generation unit 46. The ~~tail gas~~ tail gas introduced into the power generation unit 46 is burned in the presence of air or ~~oxygen~~.

~~enriched~~ oxygen-enriched air to produce power or heat. Flue gas from the power generation unit 46 is led through a line 47 to the EOR 6 for injection.

On page 15, lines 14-25, please replace the paragraph set forth therein with the following:

The present ~~invention~~ invention, in its different embodiments, also makes it possible to customize the plant and respectively alter the working conditions according to the specific need ~~and/or~~ and/or variations in economical and technical factors. Some advantages ~~by of~~ using the embodiments according to figure 4 are listed below:

- Water injection.

Water or steam are generated in several places in the GTL plant. ~~First~~ First, it should be recognized that steam is generated at elevated pressures and temperatures. In particular, the elevated pressure will be an advantage for EOR, as work for compression to the desired injection pressure will be reduced. Often the energy content of the steam is utilized in a steam turbine to produce electricity or for heat input to process units like distillation towers, whereby the steam may be condensed to water.

On page 16, lines 14-17, please replace the paragraph set forth therein with the following:

As described in Example A, steam is generated in several places in the GTL plant. As such, this is a valuable product that at least partly may be used to produce electric

power. Particularly in a remote ~~location there~~ location, it may be more feasible to use steam for EOR.

On page 17, lines 25-29, please replace the paragraph set forth therein with the following:

Using the Fischer-Tropsch tail gas for EOR opens up the possibility for a significant simplification and cost reduction for the GTL plant. In fact, a once-through concept might be feasible. No recycle also opens up the possibility for a simplified ASU using only enriched air for an ATR syngas generator. This enriched air may contain 25 % nitrogen that will end up in the tail gas and thereby the EOR stream.

On page 18, lines 22-26, please replace the paragraph set forth therein with the following:

The oxygen can be fed to an autothermal reformer for production of synthesis gas from natural gas. The process operates with a steam/carbon ratio of 0.6. The temperature and pressure at the outlet from the ATR is 1030 degrees Celsius and 45 ~~bar~~ bar, respectively. See Table 1 for the natural gas composition. ~~Note! All~~ Note, all compositions are given on a dry basis, i.e. without water.

On page 23, lines 8-10, please replace the paragraph set forth therein with the following:

Nitrogen and methane ~~has~~ have roughly the same properties in EOR operations, essentially as pressure support. ~~In~~ At the outset, we may therefore assume that the value of the neat nitrogen is equivalent to the gas price. We then will have:

On page 26, line 1, please replace the paragraph set forth therein with the following:

Patent Claims We Claim: